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A COMPARISON OF THE TRANS-APPALACHIAN RAILROADS

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If one were to draw a cross profile of the Appalachian system of ridges, and let a line ten inches long represent the distance between the Mississippi River and the Atlantic Ocean along the fortieth parallel, the Appalachians would be represented by a mere thickening of the line; for the highest ridge would need be represented by an elevation of but one-two hundredth of an inch. But small as they seem when compared with the broad expanse of plain to east and west, they have an important bearing on the location of trade routes, on determining the importance of such routes, on the distribution and growth of cities, and have had an important bearing on the whole trend of historic events from the time our forefathers began to leave the seaboard and extend their civilization westward. Such an important bearing did they have on this expansion in the seventeenth, eighteenth, and early nineteenth centuries that they have been termed by writers "The Appalachian Barrier."

This barrier consists mainly of two important ridges, the Blue Ridge on the east and the Alleghany Front, the eastern edge of the Alleghany plateau, on the west. Between these two ridges lies a region called by physiographers "The Great Appalachian Valley," which extends from Georgia northeastward to the Hudson, and there, taking a northerly trend, forms the depression between the Catskills and Adirondacks on the west and the Berkshires and Green Mountains on the east.

In Fig. 1 the Blue Ridge shows itself as a few slight ridges in northern New Jersey. In Pennsylvania it is almost lacking, but in Virginia and North Carolina it rises to elevations of over three thousand feet. The Alleghany Front in the north is encountered at the east edge of the Catskill Mountains. In east Pennsylvania it is of slight elevation, but in western Pennsylvania, Maryland and eastern West Virginia it rises to bold ridges and peaks, in some places over four thousand feet above sea level. It again sinks to insignificance in eastern Kentucky and Tennessee. The Great Appalachian Valley in the north is narrow and cut up by many short ridges more or less parallel to one another and to the Blue Ridge. In the south it broadens and opens out upon the Gulf Coastal Plain in Georgia and Alabama.

In the north this Great Valley is drained by rivers flowing eastward into the Atlantic—the Hudson, Delaware, Susquehanna and Potomac. Farther south the drainage is to the west, while at the south the rivers extend to the southwest. The Hudson flows lengthwise of the valley like

Fig. 1.—The Important Railroads of the Appalachians and the Relief. The several roads are represented by numbers.

1. The New York Central with the Boston and Maine from Albany to Boston. 2. The Erie. 3. The Lehigh Valley. 4. The Pennsylvania. 5. The Baltimore and Ohio. 6. The Chesapeake and Ohio. 7. The Norfolk and Western.

the rivers of the South; but the Delaware, Susquehanna and Potomac, which rise far over on the plateau to the west of the Alleghany Front, extend across the valley, cross through the ridges, and escape through gaps in the Blue Ridge.

The great difficulty encountered by the emigrant and railroad builder in crossing the Appalachian barrier was not in the Blue Ridge, for this could be crossed through the gaps. Nor was it in the ridges in the Great Valley; these too had gaps. The greatest obstacle was the surmounting of that bold front of the Alleghany Plateau. All the trans-Appalachian roads except the New York Central and the Erie have to overcome this two-thousand-foot obstacle. Every train passing westward across the region must lift its burden up these two thousand feet, and every train moving eastward from the Ohio River must rise from twelve hundred to fifteen hundred feet. But not so, however, with the roads along the Hudson-Mohawk route. The Hudson Valley, joined by the Mohawk from the west, forms the only natural outlet to the east from the Great Central Valley of North America and has well been called "The Eastern Gateway of the United States."

Figure 1 shows the routes taken by the several roads. Three lead from Buffalo to New York. Each of these roads has extended its line to the western termini of the Great Lakes by means of steamboat lines. The four roads to the south tap the great agricultural region of Kentucky, Ohio, Indiana, and Illinois, with a few lines extending to the Erie lake-ports. Figure 2 gives the profiles of these various roads and shows the great advantage of the New York Central over the other routes, when lift or grade is considered. Its highest altitude is reached at Batavia, about nine hundred feet, and another slight rise at Rome, up to four hundred forty-five feet. Almost parallel to this road and taking advantages of the same low grade is the West Shore, not shown in profiles or map. The Erie (No. 2), after leaving the Hudson river passes through a gap at Paterson, winds among the Highlands of New Jersey, and reaches at Middletown, N. Y. an elevation of five hundred sixty-two feet. Near Port Jervis it descends into the valley of the Delaware and continues in this to the northeast corner of Pennsylvania. East of Binghamton, N. Y., at Gulf Summit it crosses over the divide between the Delaware and upper Susquehanna, reaching a height of thirteen hundred sixty-four feet. It descends one branch of the Susquehanna and then ascends another coming in from the northwest, finally attaining its greatest elevation, 1400 feet, where it crosses the terminal moraine just west of the Genesee river; this is five hundred feet above the highest point reached by the New York Central.

The Lehigh Valley Railroad after crossing northern New Jersey to the Delaware ascends the Lehigh River to Bridgeport. Its greatest lift is found when it crosses over the divide between the Delaware and Susquehanna, at Glen Summit Springs, where it reaches an altitude of about 1750 feet. We have seen that the Erie road crosses the same divide

*Note.—The Erie, however, at two points reaches elevations of about fourteen hundred feet.

at a much lower level. This elevation on the Lehigh Valley road corresponds to the Alleghany Front found by the other roads further south. The Pennsylvania Railroad encounters the Alleghany Front near Cresson, crossing it at an elevation of about two thousand feet. The Balti-

Fig.—2. Profiles of Trans-Appalachian Railroads. The vertical scale is 125 times the horizontal.*

more and Ohio surmounts the plateau in western Maryland near Oakland at an elevation of two thousand three hundred and twenty feet; the Chesapeake and Ohio near Alleghany; and the Norfolk and Western at Blue-

*Note.—Based on altitudes in the Dictionary of Altitudes by Gannett. The altitude of each Station on each line was found and the elevations between stations were checked up by as many contour maps as were available. There may be slight defects, but in the main the profiles are true. See figures in the text for exact values.

fields in West Virginia. In all these routes the advantage of the northern route is clearly shown by a comparison of the profiles.

But the most striking thing that comes out in this comparison of the profiles of these Trans-Appalachian Railways is the almost continuous down grade of the roads between Buffalo and New York by way of the Mohawk and Hudson rivers. The only distinct rises on the whole route are just east of Buffalo and at Rome. From Albany to New York there is an imperceptible down grade. How different is the route to Boston as shown by the Boston and Maine profile! Had the merchants of Boston early been made to understand the significance of what is revealed in these two profiles, they would not have been liable to such a huge disappointment on the completion of this line. The story of this road is an interesting chapter in the history of transportation.

As settlers began to spread over the Great Central Valley and send their goods east to New York by way of the Mohawk pass, the merchants of Boston saw great commercial possibilities in this trade and desired to share in the traffic. In early days, during the canal period, a canal from Boston to Albany with a tunnel through the Berkshires was advocated. But definite action to secure what they considered their rightful share in the traffic was deferred until the railroad period, when it was again brought forward. This resulted in the building of the Boston and Albany Railroad in 1842, but this did not produce what was hoped for. A more direct route was thought to be needed and one of lower grades, and so in 1842 the Troy and Greenfield R. R. was incorporated. This later came to be the Boston and Maine R. R. and made a lower grade through the mountains in western Massachusetts by the construction of the then wonderful Hoosac tunnel. This five-mile tunnel was completed in 1873, after eighteen years of more or less continuous labor at a cost of \$14,000,000.

A writer in *Scribner's Magazine* of 1870, three years before the completion of the tunnel, expressed the expectation of the New Englanders.

"It is a matter of wonder that those enterprising gentlemen who proposed during the late war to reconstruct the map of the United States, leaving New England out in the cold, did not discover and point out the fact that New England is divided from the rest of the country by a mountain wall which might well serve as a boundary of a separate state.
* * * * The commercial intercourse of New England with the West has been greatly obstructed by this barrier. The western merchant arriving at Albany or Troy by railroad or canal finds a magnificent river waiting to bear him and his merchandise to New York; while between him and the New England market stretches for hundreds of miles up and down an abrupt and difficult mountain wall. It is not surprising, therefore, that he goes to New York with his merchandise. Emigration may follow parallels of latitude, but traffic always follows the easiest and shortest route with no reference at all to parallels or pedigree.

"The people of New England did not, however, sit down behind their mountain wall and suck their thumbs. Close business relations with the great West were essential to their prosperity and they determined to establish and maintain them. Some way must be provided whereby a share of the western trade might reach their markets. If the mountain would not give way to Mahomet, Mahomet must go through the mountain. That is how the Hoosac Tunnel came to be built. It is a clear announcement that New England does not intend to be left out in the cold."

But, alas, the announcement was of no avail. Traffic continued to follow "the easiest and shortest" route and New York continued to get the lion's share of the western trade, and grew. In 1790 New York's population numbered 33,000 to Boston's 18,000. By 1850 New York had grown to 515,000 while Boston's population numbered but 137,000; and by 1870 New York's numbers reached 942,000, while Boston numbered 250,000, mostly due to the location of New York at the entrance to the "Eastern Gateway of the United States."

This gateway has always had a great influence on man. West of it, on the plains of glacial Lake Iroquois, dwelt many strong and warlike Indians who used the pass in the Mohawk valley on their expeditions of hunting or of war. The Mohawk was a part of the old Iroquois trail that led from the mouth of the Mohawk to Niagara Falls. The Dutch fur-trader early found his along this same route. In pioneer days emigrants to the West found this their easiest road. It was early given the preference in the transportation of goods by wagon from the then West to the East. Along this route was built the first American canal of any note, and among the first railroads in America was one from Albany to Schenectady, a distance of eighteen miles. Along it has been concentrated many industries and cities, so that "80 per cent. of the people and 90 per cent. of the wealth of the state of New York is found in the counties bordering the Hudson River and the Erie Canal." Today six tracks lead through this route from the city of Buffalo, which draws its freight from a large territory bordering the Great Lakes. In 1906 over 4,000,000 tons of grain and flour passed into the port of Buffalo and over 491,000 thousand feet of lumber was unloaded there and at Tonawanda, its neighbor. Most of this grain, flour, and lumber finds its way over the Appalachian barrier by way of the Mohawk-Hudson route. The lines to the south get little of the lake traffic. Cleveland in 1906 received but 37,000 tons of grain, while the receipts at Toledo were but 8,000 tons. In lumber Cleveland received 174,000 feet and Toledo 38,000. It is true that in the rich industrial and agricultural region to the south of the Great Lakes, the Pennsylvania and other trans-Appalachian roads have their "feeders." But so have the roads that lead through the Mohawk-Hudson pass, and hence Nature and man have designed these roads to be the most important of the trans-Appalachian routes.

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